RePlastix Innovations: Transforming Plastic Waste into Sustainable Solutions

ABSTRACT

This project, titled *"RePlastix Innovations: Transforming Plastic Waste into Sustainable Solutions,"* uses Salesforce to automate and manage the operations of a company that recycles plastic waste into eco-friendly construction materials. The solution includes custom objects, workflows, and dashboards to track waste collection, processing, inventory, and deliveries. Automated task assignments and real-time reporting improve operational efficiency and support data-driven sustainability. This project demonstrates how Salesforce can power green innovation through smart automation and cloud-based management.

The system incorporates role-based access control to ensure data security and clean user separation between departments such as logistics, processing, and sales. Real-time dashboards and custom reports are configured to provide actionable insights into KPIs such as recycled volume, emission reduction, and order fulfillment rates. Integration with third-party services (where required) further enhances the system's functionality and scalability.

This Salesforce implementation helps RePlastix Innovations achieve greater efficiency, transparency, and scalability in their operations while reinforcing their environmental impact through data-driven sustainability reporting. The project showcases how CRM and cloud automation can effectively support the circular economy and green business models.

OBJECTIVE

The objective of this project is to design and implement a Salesforce-based solution for **RePlastix Innovations** to efficiently manage and automate their end-to-end plastic recycling operations. This includes streamlining workflows for waste collection, processing, inventory tracking, order management, and sustainability reporting. By leveraging Salesforce CRM, the project aims to:

- Digitize manual processes and reduce operational delays
- Enable real-time tracking of plastic waste from intake to final product
- Automate task assignments to improve team productivity
- Maintain accurate records for inventory and dispatch
- Generate insightful dashboards for monitoring environmental impact
- Support the company's mission to promote a circular economy through data-driven decision-making.

Technology Description

This project is built using the **Salesforce Platform**, leveraging its powerful declarative tools, automation features, and programmatic capabilities to manage the plastic waste recycling lifecycle—from collection to product delivery. Below is a step-by-step breakdown of the technologies and components used in the project:

1. Custom Objects and Fields

To map business operations, **five custom objects** were created:

- **Re_Plastic_Innovations_Plastic_Waste__c** – Tracks plastic waste intake. *Fields*: Weight, Type, Collection Date, Status, Location
- **Re_Plastic_Innovations_Recycling_Center__c** – Manages center locations and capacity
- **Re_Plastic_Innovations_Recycled_Product__c** – Stores stock and pricing of recycled items
- **Re_Plastic_Innovations_Order__c** – Records product orders from customers
- **Re_Plastic_Innovations_Restock_Request__c** – Handles stock refill requests when inventory drops

2. Lightning App and Tabs

A custom **Lightning App** called *Re Plastic Innovations* was created to bring all objects under one UI:

- Navigation items like Plastic Waste, Orders, Recycling Centers, etc., were added
- Custom tabs were created for each object to allow visibility and access via the app interface

3. Role Hierarchy

A clear **role structure** was set up to enforce record-level access and reporting hierarchy:

- **CEO**
    - ↳ **Recycling Manager**
    - ↳ **Sales Representative**
        - ↳ **Warehouse Supervisor**

This allows precise control over who can access or view records based on their role.

4. Custom Profiles and Object Permissions

Three **custom profiles** were created with tailored access:

- **Platform 1** – Create/Read: Plastic Waste, Read-Only: Restock Request
- **Platform 2** – Create/Read: Orders, Accounts; Read-Only: Recycled Products
- **Platform 3** – Full access to all custom objects

This ensured field-level and object-level security per user function.

5. Users Creation

Three users were created and mapped to profiles and roles:

- **John (Production Engineer)** – Recycling Manager, Platform 1
- **Mike (Quality Inspector)** – Sales Representative, Platform 2
- **Albert (Plant Manager)** – Warehouse Supervisor, Platform 3

Passwords were reset, and emails were verified for access.

6. Record-Level Security (Sharing Rules)

OWD (Organization-Wide Defaults) were set appropriately, and custom **Sharing Rules** were added:

- CEO → Recycling Manager (Read access to Plastic Waste)
- CEO → Sales Rep (Read access to Recycled Products)
- Sales Rep → Warehouse Supervisor (Read access to Restock Requests)

This ensures secure sharing of specific records across roles.

7. Formula Fields & Validation Rules

- **Formula Field** on *Recycled Product*: Shows "Low Stock - Restock Needed" if stock is below threshold
- **Validation Rules**:
    - Orders cannot have quantity ≤ 0
    - Plastic waste cannot have a future collection date

These enforce business logic at the data entry level.

8. Scheduled Flow

A **Scheduled Flow** was implemented to run **daily at 6:00 AM**:

- Checks for stock levels below threshold
- Automatically creates a **Task** to notify the product owner to restock
- Helps in proactive inventory control without manual tracking

9. Apex Class: InventoryManager

A custom **Apex Class** automates backend logic:

- **processOrderStock()** – Reduces stock after order; creates restock request if needed
- **processRestockApproval()** – Increases stock automatically when restock is approved

10. Apex Triggers

Two triggers were implemented:

- **UpdateStockAfterOrder** – Calls processOrderStock() after order creation
- **UpdateStockAfterRestockApproval** – Calls processRestockApproval() and triggers email notification when restock is approved

11. Email Notification

An **Apex Class EmailNotificationHelper** was created:

- Sends automated email to warehouse when a restock request is approved
- Keeps relevant teams informed for timely stock updates

12. Test Class

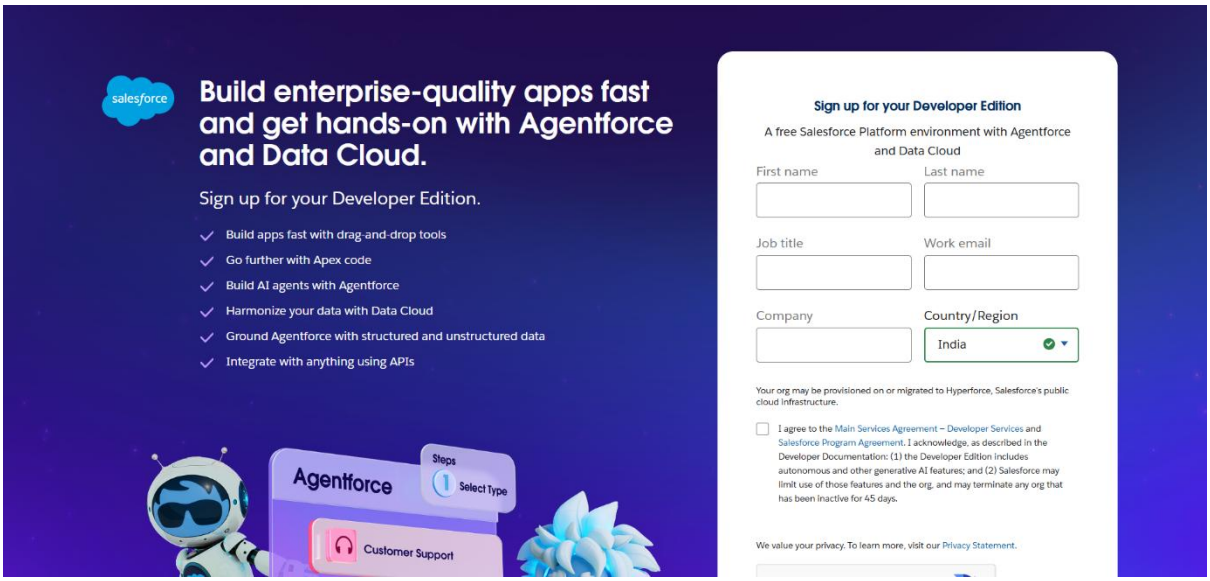
A robust **test class InventoryManagerTest** was written:

- Covers both stock reduction and restock approval scenarios
- Achieves **100% code coverage** as per Salesforce best practices

DETAILED EXECUTION OF PROJECT PHASES

1.Developer Org Setup

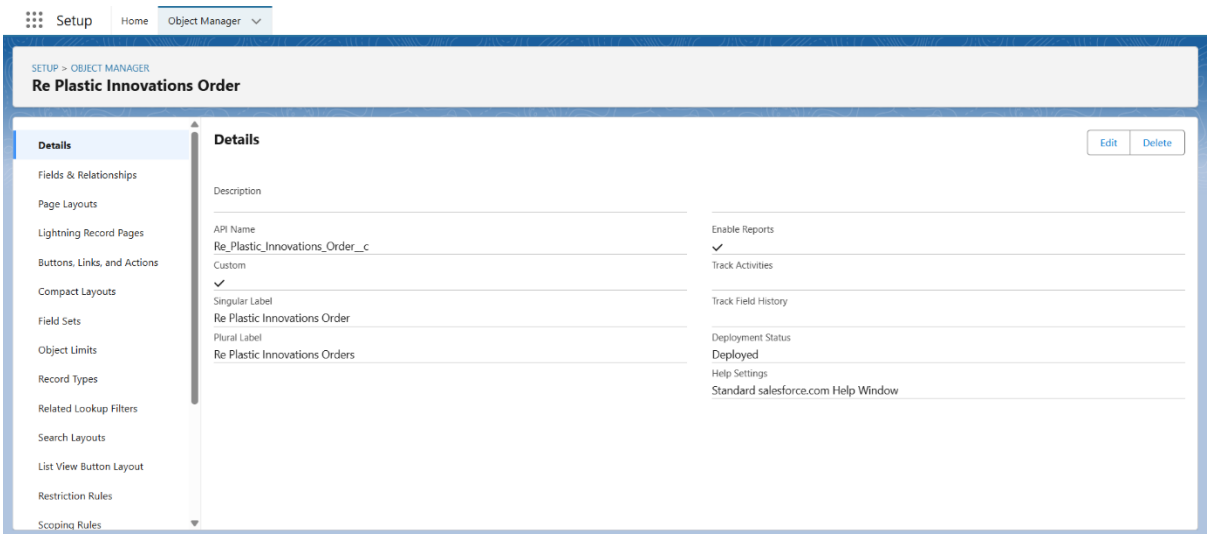
- Created a Salesforce Developer Account.
- https://developer.salesforce.com/signup



- Verified email and logged in to access Salesforce environment.

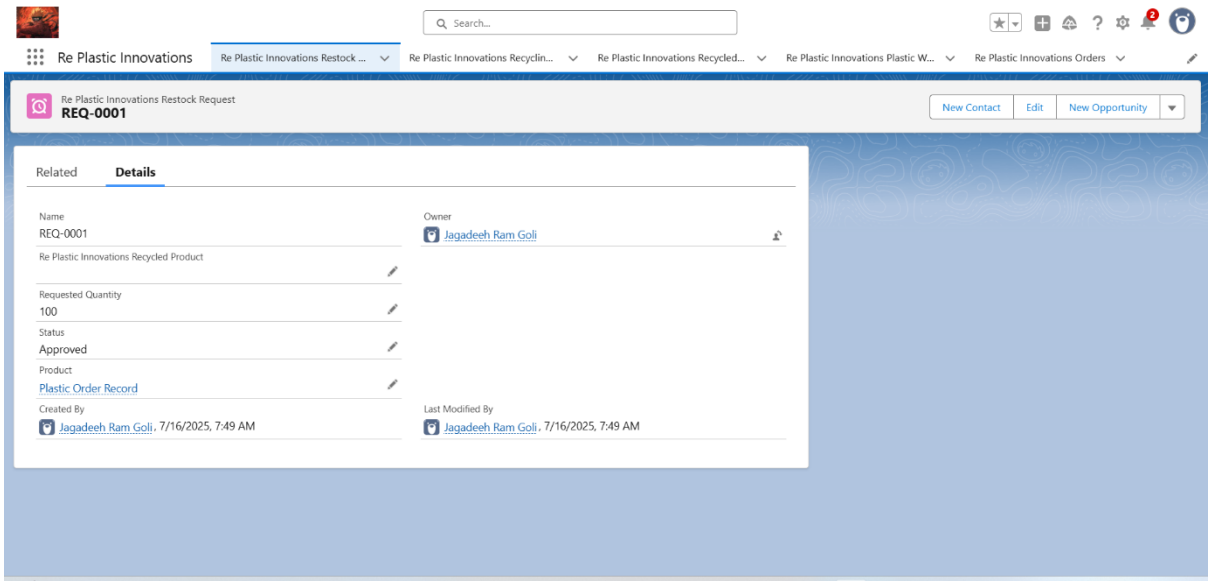
2.Custom Objects & Fields

- Built five custom objects (Plastic Waste, Recycling Centers, Recycled Products, Orders, Restock Requests).
- Each object includes key custom fields like weight, stock levels, thresholds, and delivery **dates.**



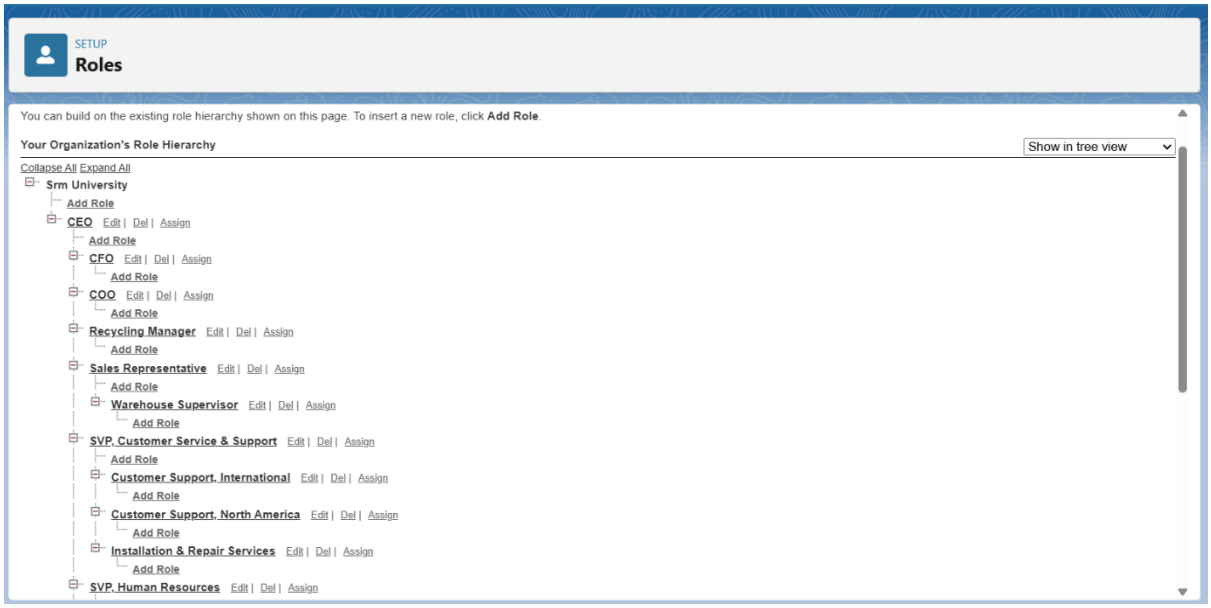
3.Lightning App Builder

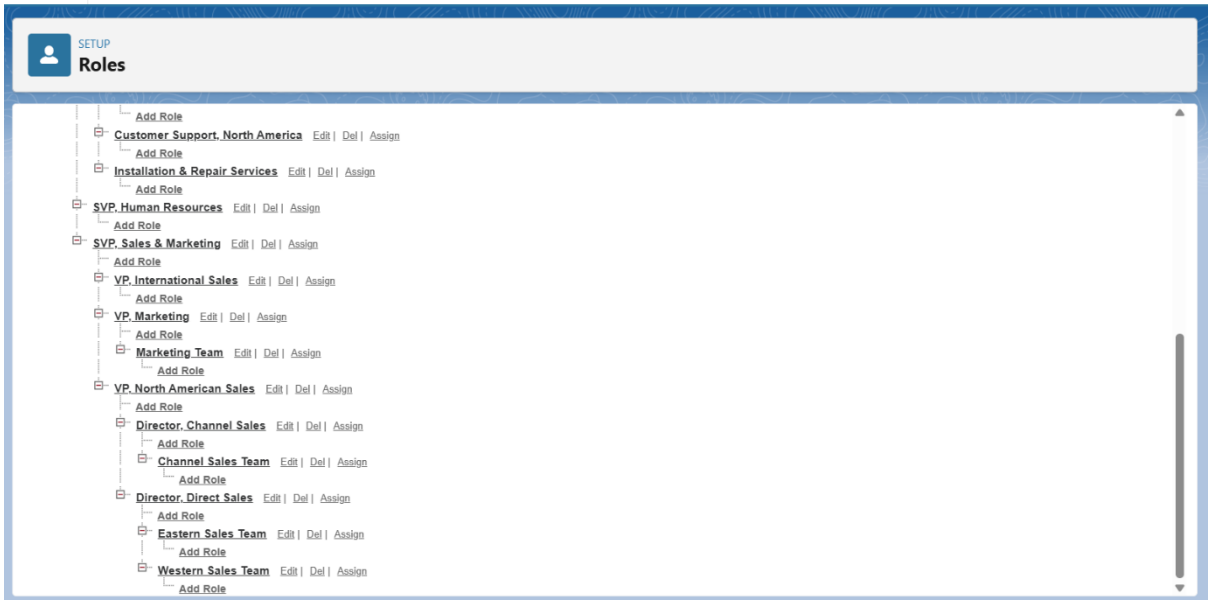
- Created a custom Lightning app “Re Plastic Innovations” for easy navigation and object management.



4.User Management

- Defined roles (CEO, Recycling Manager, Sales Rep, Warehouse Supervisor).
- Created profiles (Platform 1/2/3) and users with role-profile mappings.
- Implemented record-level access using sharing rules and OWD settings.



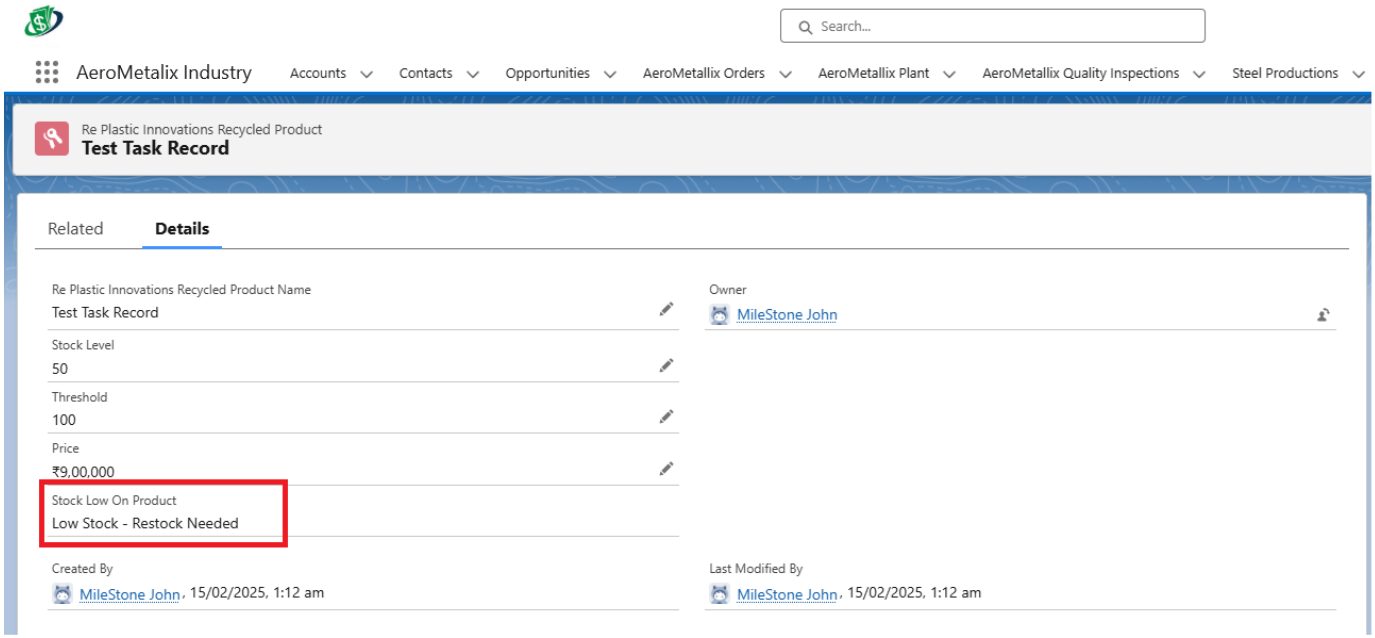


5.Validation Rules

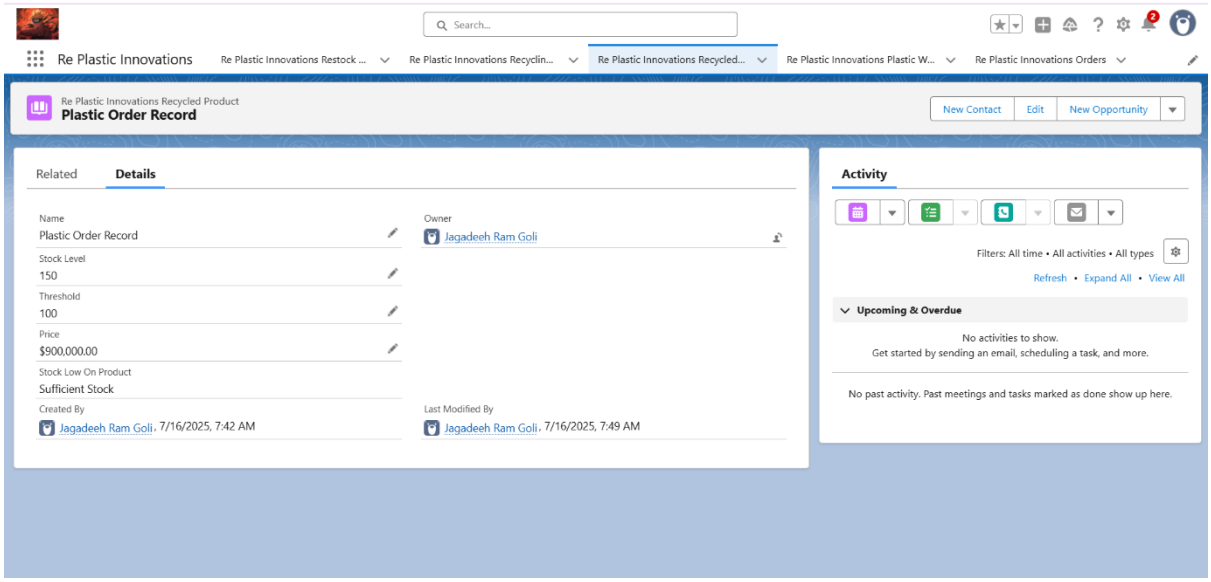
- Ensured data integrity (e.g., no future collection dates, quantity > 0).

6.Formula Fields

- Dynamic logic to check stock status (Low Stock - Restock Needed).

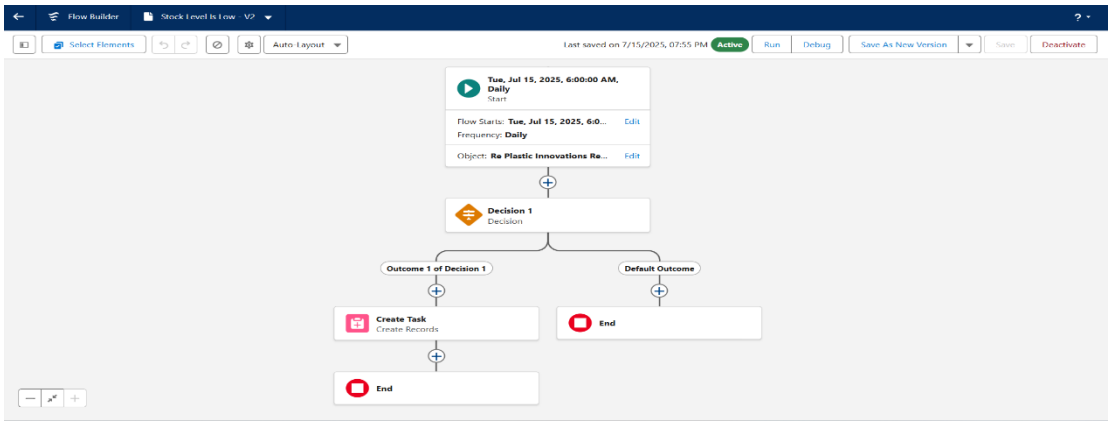


Change Stock Value



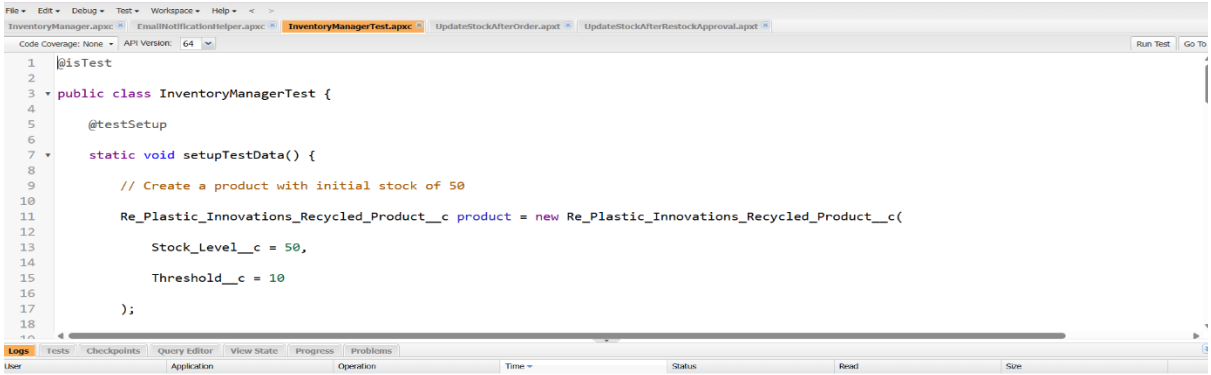
7.Flows

- Automated scheduled checks daily at 6:00 AM to identify low stock and create tasks.



8.Apex Classes & Triggers

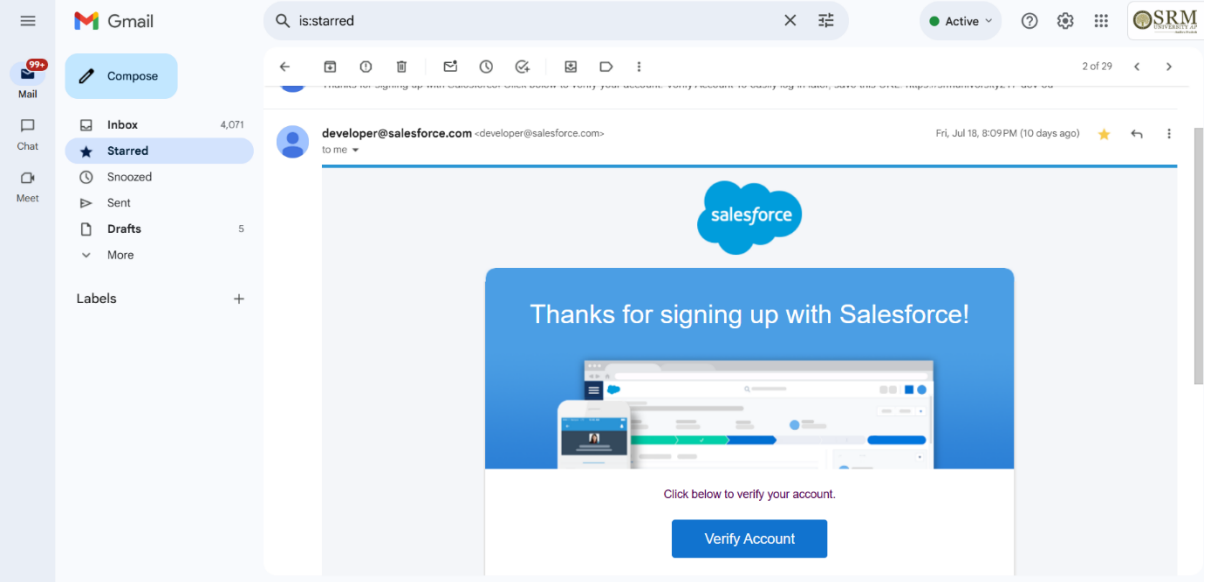
- InventoryManager Apex class manages stock updates and restock logic.
- Triggers automate real-time reactions to order creation and restock approvals.



```
@isTest
public class InventoryManagerTest {
    @testSetup
    static void setupTestData() {
        // Create a product with initial stock of 50
        Re_Plastic_Innovations_Recycled_Product__c product = new Re_Plastic_Innovations_Recycled_Product__c(
            Stock_Level__c = 50,
            Threshold__c = 10
        );
```

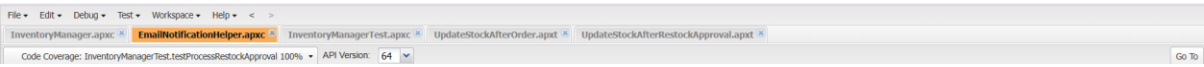
9.Email Notifications

- On approval of restock, an email is sent to the warehouse manager to notify about updated stock.



10.Test Classes

- Created unit test classes for full trigger and Apex logic coverage ensuring 100% code coverage.



Step-by-Step Project Explanation with Real-World Example

Imagine RePlastix Innovations is a company that collects plastic waste from various locations, recycles it, and sells recycled plastic products to manufacturers.

1. Plastic Waste Collection

- Field workers log daily plastic collection data in the Plastic Waste Object.
- Example: 20 kg of PET plastic collected on July 25 in Bangalore.

2. Storage at Recycling Center

- Waste is sent to a Recycling Center, tracked with location and capacity details.

3. Recycled Product Creation

- Once processed, the waste becomes products like recycled pellets. These are stored and tracked via the Recycled Product Object.

- Product A has stock level: 50, threshold: 100.

4. Customer Order Creation

- A manufacturer places an order using the Order Object.

- Order: 150 units of Product A → but only 50 units in stock.

5. Trigger Automation

- Apex Trigger UpdateStockAfterOrder:

- Checks available stock.

- Reduces what's in stock.

- Creates a Restock Request for remaining 100 units.

6. Restock Request Handling

- Warehouse Manager sees the pending request. Once approved, another Apex Trigger fires:

- Updates product stock by 100 units.

- Sends email notification to warehouse manager.

7. Scheduled Daily Flow

- Each morning, a Scheduled Flow checks for products with low stock.

- If found, a task is automatically created and assigned to the product owner to refill the stock.

8. Security & Access Control

- Only authorized users (like the Recycling Manager or Warehouse Supervisor) can view or edit specific records, ensuring secure data handling.

9. Dashboards & Reports

- Admin creates dashboards to visualize:

- Daily collection stats

- Orders and pending deliveries

- Low stock alerts

Conclusion

The “**RePlastix Innovations”** project isn’t just about using Salesforce — it’s about creating real change. By building a smart and simple system to manage plastic waste, we’re making it easier for teams to track, recycle, and reduce pollution.

With features like daily stock checks, automatic alerts, and customized access for users, the process becomes smooth and reliable. It helps warehouse staff stay on top of stock levels, ensures managers get notified when something is missing, and keeps everything organized.

In the bigger picture, this project shows how technology can solve real environmental problems. It’s a step toward cleaner cities, less plastic waste, and a future where recycling is not only possible—but efficient and impactful. Through this solution, we’re proving that **small actions, powered by smart systems, can lead to a greener tomorrow**.